

CLAIMS

Subj

1. Multilayer structure comprising at least one internal layer and at least one external layer,
5 ~~wherein~~ characterized in that at least the internal layer is formed from a composition comprising at least one thermoplastic polyamide and at least one impact-resistance modifier present at a concentration by weight of between 10 and 50% of ~~the~~ said 10 composition, and in that at least the external layer is formed from a composition comprising as polymer matrix a polyamide composition ~~selected from the group~~ comprising:
15 (i) a polyamide thermoplastic copolymer obtained by copolymerization of ~~ε-caprolactam~~ with at least one of the monomers selected from the group comprising:
• an amino acid comprising at least 9 carbon atoms, or the corresponding lactam
• a mixture of hexamethylenediamine with a diacid
20 comprising at least 9 carbon atoms, the ratio by weight between the ϵ -caprolactam and the total amount of hexamethylenediamine and diacid and/or the said amino-acid being between 4 and 9 ^{or}
(ii) a mixture of at least ~~the~~ said thermoplastic 25 polyamide copolymer (i) and at least one second thermoplastic polyamide or copolyamide obtained by polymerization of monomers comprising fewer than 9 carbon atoms, the content by weight of the second

John
polymer or copolymer in the polymer matrix being
between 0 and 80% by weight.

John
2. Structure according to claim 1,
characterized in that the composition forming the
5 external layer comprises a impact modifier.

A
3. Structure according to claim 2,
John
characterized in that the content of impact modifier
present in the external layer when the polymer matrix
is formed by the mixture (ii) is between 5% and 50% by
10 weight of the thermoplastic composition forming the
said layer.

John
4. Structure according to ~~one of claims 1~~ *claim 1*,
to 3, characterized in that it forms a pipe, a tube or
the walls of a chamber.

A
15 5. Structure according to ~~one of claims 1~~ *claim 1*,
to 4, characterized in that it comprises intermediate
layers arranged between the external and internal
layers.

John
20 6. Structure according to claim 5,
John
characterized in that some of the said intermediate
layers are formed from a composition similar to the one
forming the external layer of the structure.

A
7. Structure according to claim 5,
John
characterized in that some of the intermediate layers
25 are formed from a composition similar to the one
forming the internal layer.

A
8. Structure according to ~~one of claims 5~~ *claim 5*,
John
to 7, characterized in that the internal-type
intermediate layers and the external-type intermediate

layers are arranged alternately in the transverse direction of the structure.

A A
9. Structure according to one of claims 5
to 8, characterized in that it comprises outer layers
5 formed by a composition similar to the one forming the
external layer, and at least one intermediate layer
formed by a composition of the type forming the
internal type layers.

A A
10. Structure according to one of the
preceding claims, characterized in that the composition
forming the external layer and/or the external-type
intermediate layers comprises a first thermoplastic
copolyamide of the 6/6-36 type, and a second
thermoplastic polyamide of the PA 6 type.

A A
15. Structure according to one of the
preceding claims, characterized in that the composition
forming the external layer and/or the external-type
intermediate layers comprises a impact modifier, this
modifier advantageously comprising functional groups
20 which can react with the polyamide or polyamides.

A A
12. Structure according to one of the
preceding claims, characterized in that the composition
forming the internal layer and/or the internal-type
intermediate layers has a modulus of less than
25 1500 MPa, preferably less than 1000 MPa.

A A A
13. Structure according to one of the
preceding claims, characterized in that the composition
forming the internal layer comprises a chain extender
for the polyamide matrix, which is present at a

concentration by weight of between 0.05% and 5% of the polyamide matrix.

A 3
~~14. Structure according to one of the preceding claims, characterized in that the impact modifier contained in the composition forming the internal layer is selected from the group comprising compounds having a T_g below 0°C and a modulus of less than 200 MPa.~~

A 10
~~15. Structure according to claim 14, characterized in that the said impact modifier is a compound selected from the polyolefin group.~~

A 15
~~16. Structure according to claim 14 or 15, characterized in that at least some of the impact modifiers comprise polar functional groups capable of reacting with the polyamide matrix.~~

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~~17. Structure according to claim 16, characterized in that the polar functional groups are selected from the group comprising acid, anhydride, acrylic, methacrylic and epoxy functional groups.~~

A 20
~~18. Structure according to one of claims 15 to 17, characterized in that the impact modifier is an ultra-low-density polyethylene (ULDPE) having a density of less than 0.9 and a melt flow index of between 0.1 and 7 g/10 min measured at 190°C under a load of 2.16 kg, preferably of less than 1 g/10 min.~~

A 25
~~19. Structure according to one of the preceding claims, characterized in that the composition forming the internal layer and/or the internal-type intermediate layers comprises a plasticizer for the~~

